Decision Support for Chronic Management of Asthma

GLIDES PROJECT
Guidelines Into Decision Support
sponsored by
the Agency for Healthcare Research and Quality

Yale New Haven Health
Yale School of Medicine
Nemours

AHRQ National Resource Center for Health Information Technology
Asthma in Connecticut

- 86,000 children in CT have asthma (9.7% of school population)
- Asthma prevalence is highest in the lowest income groups
- African-American and Hispanic children are hospitalized 5x as often as white children with asthma
- New Haven’s rate of ED visits for asthma is second highest in CT
- Widespread lack of understanding about asthma causes, treatment and symptom prevention
Clinical Objectives

• Measure asthma control in a formalized manner
  – Optimize decision making; improve documentation of care, communication among providers
• Choose appropriate therapies
  – Prevent errors of omission/commission, optimize treatment
• Distribute a personalized asthma action plan
  – Improve patient empowerment, improve education, improve communication
• Improve provider satisfaction with CDSS
National Heart, Lung, and Blood Institute

National Asthma Education and Prevention Program

Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma

Full Report 2007
### Figure 4-3b. Assessing Asthma Control and Adjusting Therapy in Children 5–11 Years of Age

<table>
<thead>
<tr>
<th>Components of Control</th>
<th>Classification of Asthma Control (5–11 years of age)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Well Controlled</td>
</tr>
<tr>
<td><strong>Impairment</strong></td>
<td></td>
</tr>
</tbody>
</table>
| Short-acting 
  β<sub>2</sub>-agonist use 
  for symptom control 
  (not prevention of EIB) | ≤2 days/week | >2 days/week or multiple times on ≤2 days/week | Throughout the day |
| Lung function          |                  |                     |                         |
| FEV₁, or peak flow    | >80% predicted/ 
  personal best | 60–80% predicted/ 
  personal best | <60% predicted/ 
  personal best |
| FEV₁/FVC               | >80%            | 75–80%               | <75%                    |
| Risk                   |                  |                     |                         |
| Exacerbations requiring 
  oral systemic 
  corticosteroids | 0–1/year | ≥2/year (see note) |                         |
| Reduction in lung growth | Consider severity and interval since last exacerbation | Evaluation requires long-term followup. |                         |
| Treatment-related adverse effects | Medication side effects can vary in intensity from nose to very troublesome and worrisome. The level of intensity does not correlate to specific levels of control but should be considered in the overall assessment of risk. | | |

#### Recommended Action for Treatment

(See figure 4–1b for treatment steps.)

- Maintain current step.
- Regular followup every 1–6 months.
- Consider step down if well controlled for at least 3 months.

- Step up at least 1 step and 
  Reevaluate in 2–6 weeks.
- For side effects: consider alternative treatment options.
- Consider short course of oral systemic corticosteroids.
  Step up 1–2 steps, and 
  Reevaluate in 2 weeks.
- For side effects, consider alternative treatment options.

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**Key:**
- EIB, exercise-induced bronchospasm
- FEV₁, forced expiratory volume in 1 second
- FVC, forced vital capacity

**Notes:**
- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- The level of control is based on the most severe impairment or risk category. Assess impairment domain by patient’s/caregiver’s recall of previous 2–4 weeks and by spirometry/or peak flow measures. Symptom assessment for longer periods should reflect a global assessment such as inquiring whether the patient’s asthma is better or worse since the last visit.
- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma control. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate poorer disease control. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have persistent asthma, even in the absence of impairment levels consistent with persistent asthma.
- Before step up in therapy:
  - Review adherence to medications, inhaler technique, environmental control, and comorbid conditions.
  - If alternative treatment option was used in a step, discontinue it and use preferred treatment for that step.
**Figure 4-3b. Assessing Asthma Control and Adjusting Therapy in Children 5-11 Years of Age**

### Components of Control

<table>
<thead>
<tr>
<th>Classification of Asthma Control (5-11 years of age)</th>
<th>Well Controlled</th>
<th>Not Well Controlled</th>
<th>Very Poorly Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>≤2 days/week</td>
<td>&gt;2 days/week or multiple times a ≥2 days/wk</td>
<td>Throughout the day</td>
</tr>
<tr>
<td>Nighttime awakening</td>
<td>None</td>
<td>Some limitation</td>
<td>Extremely limited</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
<td>Some limitation</td>
<td>Extremely limited</td>
</tr>
<tr>
<td>Short acting bronchodilators for symptoms control</td>
<td>≤2 days/week</td>
<td>&gt;2 days/week</td>
<td>Several times per day</td>
</tr>
<tr>
<td>FEV1 or peak flow</td>
<td>≥80% predicted</td>
<td>60-80% predicted</td>
<td>&lt;60% predicted</td>
</tr>
<tr>
<td>Risk</td>
<td>Exacerbations</td>
<td>0-1/year</td>
<td>≥2/year (see note)</td>
</tr>
</tbody>
</table>
| Evaluation requires long-term follow-up             | Treatment-related adverse affects | Requires consideration of specific control

### Recommended Action for Treatment

- Maintain current step.
- Regular follow-up every 1-6 months.
- Consider step down if well controlled for at least 3 months.
- Step up at least 1 step and re-evaluate in 3-6 weeks.
- For side effects: consider alternative treatment options.

### Classifying Components of Asthma Control

<table>
<thead>
<tr>
<th>Impairment</th>
<th>Well Controlled</th>
<th>Not Well Controlled</th>
<th>Very Poorly Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEV1/FVC</td>
<td>≥70%</td>
<td>60-70%</td>
<td>&lt;60%</td>
</tr>
<tr>
<td>Risk</td>
<td>Exacerbations</td>
<td>0</td>
<td>1 in last year</td>
</tr>
<tr>
<td>Hospitalizations</td>
<td>0</td>
<td>1 in last year</td>
<td>2 in last year</td>
</tr>
</tbody>
</table>

**Medication Adverse Effect**

- Tachycardia
- Palpitations
- Dizziness
- Sleep Disturbances
- Decreased Growth
- Other

**Key:** EIB, exercise-induced bronchoconstriction; FEV1, forced expiratory volume in 1 second; FVC, forced vital capacity.

**Notes:**

- The stepwise approach is meant to assist, not replace, the clinical decision-making required to meet individual patient needs.
- The level of control is based on the most severe impairment or risk category. Assess impairment domain by patient’s caregiver’s recall of previous 3-4 weeks and by spirometry or peak flow measures. Symptom assessment for longer periods should reflect a global assessment such as inquiring whether the patient’s asthma is better or worse since the last visit.
- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma control. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate poorer disease control. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have persistent asthma, even in the absence of impairment levels consistent with persistent asthma.

**Before step up in therapy:**

- Review adherence to medications, inhaler technique, environmental control, and comorbid conditions.
- If alternative treatment option was used in a step, discontinue it and use preferred treatment for that step.
<table>
<thead>
<tr>
<th>Impairment</th>
<th>Well Controlled</th>
<th>Not Well Controlled</th>
<th>Very Poorly Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough</td>
<td>None</td>
<td>&lt;=2days/wk</td>
<td>&gt;2days/wk</td>
</tr>
<tr>
<td>Wheezing</td>
<td>None</td>
<td>&lt;=2days/wk</td>
<td>&gt;2days/wk</td>
</tr>
<tr>
<td>Chest tightness</td>
<td>None</td>
<td>&lt;=2days/wk</td>
<td>&gt;2days/wk</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>None</td>
<td>&lt;=2days/wk</td>
<td>&gt;2days/wk</td>
</tr>
<tr>
<td>Nighttime awakening</td>
<td>None</td>
<td>&lt;=1x/month</td>
<td>&gt;=2x/month</td>
</tr>
<tr>
<td>Interference with</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>normal activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SABA use (not for EIB)</td>
<td>None</td>
<td>&lt;=2days/wk</td>
<td>&gt;2days/wk but not daily</td>
</tr>
<tr>
<td>FEV1 or peak flow</td>
<td>&gt;80%</td>
<td></td>
<td>60-80% predicted</td>
</tr>
<tr>
<td>FEV1/FVC</td>
<td>&gt;80%</td>
<td></td>
<td>75-80%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;=75%</td>
</tr>
<tr>
<td>Risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute/ER visit(s)</td>
<td>0</td>
<td></td>
<td>2 in last year</td>
</tr>
<tr>
<td>due to asthma</td>
<td></td>
<td></td>
<td>3 in last year</td>
</tr>
<tr>
<td>Hospitalizations</td>
<td>0</td>
<td></td>
<td>2 in last year</td>
</tr>
<tr>
<td>due to asthma</td>
<td></td>
<td></td>
<td>3 in last year</td>
</tr>
<tr>
<td>Exacerbations requiring</td>
<td>0-1/year</td>
<td></td>
<td>&gt;=2/year</td>
</tr>
<tr>
<td>oral steroids</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment-related</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>adverse effects</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Medication Adverse Effect**

- Thrush
- Palpitations
- Jitteriness
- Sleep Disturbances
- Decreased Growth
- Other

**Comments**

None
Behind the Scenes

- Save each symptom and its frequency for consultant’s letter
- Interpret Impairment: None, Mild, Moderate, Severe
- Interpret Risk: Low, Moderate, High
- Interpret Control: Well-controlled, Not well-controlled, Very poorly
**Figure 4-1: Stepwise Approach for Managing Asthma in Children 0-4 Years of Age**

**Persistent Asthma: Daily Medication**
- Consult with asthma specialist if step 5 care or higher is required. Consider consultation at step 2.

**Step 1.** Preferred: SABA PRN
- Step 2. Preferred: Medium-dose ICS
- Step 3. Preferred: High-dose ICS + LABA or Montelukast

**Step 4.** Preferred: Oral systemic corticosteroid
- Consider consultation

**Step 5.** Preferred: High-dose ICS + LABA, or COMBO
- Preferred: Medium-dose ICS + LABA, or COMBO
- Preferred: Medium-dose ICS

**Step 6.** Preferred: High-dose ICS + LABA, or COMBO
- Preferred: High-dose ICS + LABA, or COMBO

**Recommended Step for Asthma Management**

***Selected step in the last visit: 2***

<table>
<thead>
<tr>
<th>Intermittent Asthma</th>
<th>Persistent Asthma: Daily Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: Preferred:</td>
<td>SABA PRN</td>
</tr>
<tr>
<td>Step 2: Preferred:</td>
<td>Medium-dose ICS</td>
</tr>
<tr>
<td>Step 3: Preferred:</td>
<td>High-dose ICS + LABA or Montelukast</td>
</tr>
<tr>
<td>Step 4: Preferred:</td>
<td>Oral systemic corticosteroid</td>
</tr>
<tr>
<td>Step 5: Preferred:</td>
<td>High-dose ICS + LABA, or COMBO</td>
</tr>
<tr>
<td>Step 6: Preferred:</td>
<td>High-dose ICS + LABA, or COMBO</td>
</tr>
</tbody>
</table>

**Quick Relief Medication for All Patients**
- SABA as needed for symptoms. Intensity of treatment depends on severity of symptoms.
- Use oral systemic corticosteroid if severe or patient has history of previous severe exacerbations.
- Caution: High-dose ICS may indicate the need for step up treatment. See text for recommendations on initiating daily high-dose ICS treatment.

**Notes:**
- Alphabetic order is used when more than one treatment option is listed within either preferred or alternative therapy. ICS, inhaled corticosteroid; LABA, inhaled long-acting beta-agonist; SABA, inhaled short-acting beta-agonist.

**Patient Education and Environmental Control at Each Step**

- Education on reducing risk factors, environmental control, and adherence to medications needed.

**Comments/Reason for variance:**

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According to EPR3, this patient meets criteria for Step 3.

**Step 3**

<table>
<thead>
<tr>
<th>Persistent Asthma: Daily Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 3</strong></td>
</tr>
<tr>
<td>Preferred: Medium-dose ICS + LABA, COMBO</td>
</tr>
<tr>
<td>Alternative: Medium-dose ICS + LTRA</td>
</tr>
<tr>
<td>Consult Asthma Specialist</td>
</tr>
</tbody>
</table>

**Step 4**

| Preferred: High-dose ICS + LABA, COMBO |
| Alternative: High-dose ICS + LTRA |
| Consult Asthma Specialist            |

**Step 5**

| Preferred: High-dose ICS + LABA, COMBO |
| Alternative: High-dose ICS + LTRA |
| Consult Asthma Specialist            |

**Step 6**

| Preferred: High-dose ICS + LABA, COMBO |
| Alternative: High-dose ICS + LTRA |
| Consult Asthma Specialist            |

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**Patient Education and Environmental Control at Each Step**

**Quick-Relief Medication for All Patients**

- SABA as needed for symptoms. Intensity of treatment depends on severity of symptoms: up to 3 treatments at 20-minute interval as needed. Short course of oral systemic corticosteroids may be needed.
- Caution: Increasing use of SABA or use >2 days a week for symptom relief (not prevention of EIB) generally indicates inadequate control and the need to step up treatment.

**Comments/Reason for variance:**

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### Selected Treatment Step: 3

**Quick-Relief**
- Short acting B-2 agonist

**Long Term Control**
- **Preferred**
  1. Low-dose inhaled steroid
  2. LTRA
  3. MEDIQ

- **or**
  1. COMBO: Long-acting B-2 agonist and/or LTRA

- **or**
  1. Medium-dose inhaled steroid

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**Back to Steps**
Clinical Objectives

• Measure asthma control in a formalized manner
• Choose appropriate therapies
• Distribute a personalized asthma action plan
• Improve provider satisfaction with CDSS